REYKHMAN, I.R.

Prospecting data on the Mardakian offshore field. Azerb.neft.
khoz. 38 no.11:6-8 N '59.   (MIRA 13:5)
    (Mardakian region (Caspian Sea)--Petroleum geology)

REYKHMAN, I.R.; ALIYEV, S.M. [deceased]

Classification of oil and gas fields according to their structural type. Izv.vys.ucheb.zav.; neft' i gaz. 2 no.11: 19-21 '59. (MIRA 13:4)

1. Azerbaydzhanskiy institut nefti i khimii im. M.Azizbekova. (Oil fields--Classification)

REYKHMAN, I.R.

Prospecting for oil and gas pools in Cretaceous sediments of
the Apsheron producing area. Izv.vys.ucheb.zav.; neft' i gas
l no.12:23-26 '58.
(MIRA 12:4)

1. Azerbaydzhanskiy industrial'nyy institut im. M.Azizbekova.
(Apsheron Peninsula--Petroleum geology)
(Apsheron Peninsula--Gas, Natural--Geology)

REYKHMAN, I.R.

Methods of prospecting for stratigraphic oil pools. Azerb.
neft. khoz. 37 no.7:4-6 Jl '58.   (MIRA 11:9)
        (Apsheron Peninsula--Petroleum geology)

REYKHMAN, Iosif Ruvinovich, kand.geol.-miner.nauk; EYVAZOV, E.G., red.;
SHTEYNGEL', A.S., red.izd-va

[Binagady oil field] Binagadinskoe neftianoe mestorozhdenie.
Baku, Azerbaidzhanskoe gos.izd-vo neft. i nauchno-tekhn.lit-ry,
1959. 69 p.   (MIRA 13:3)
     (Binagady region (Azerbaijan)--Petroleum geology)

REYKHMAN, I.R.; KERIMOV, B.M.

TSyurupa shoal is the most favorable area for studying the tectonics, lithology, and oil and gas potentials of the Apsheron oil-bearing province. Azerb.neft.khoz. 39 no.9: 4-6 S'60.

(MIRA 13:10)

(Apsheron Peninsula--Petroleum geology)
(Apsheron Peninsula--Gas, Natural--Geology)

Influence of excited gases on the processes in the cathode section of the glow discharge. E. Reikhrudel and G. Spivak. *Physik. Z. Sowjetunion* 10, 121-41 (1936)(in German).—The concn. of metastable atoms in the discharge tube was varied by illuminating the discharge tube completely or in part with an outside Ne lamp of high intensity. The effect on various discharge characteristics of the presence of metastable atoms in pure Ne and Ne mixed with small amts. of A was detd. The concn. of metastable atoms varies in different parts of the tube, with the max. concn. in the neg. glow and in the transition region to the Faraday dark space.   E. O. Wiig

The study of plasma by the method of its disturbance by the magnetic field. G. V. Spivak and E. M. Reikhrudel. *Bull. acad. sci. U. R. S. S., Classe sci. math. nat., Sér. phys.* 1938, No. 4, 179-91 (in English, 191). - The method can be applied both to the study of processes in the undisturbed plasma, and to the study of the effects produced by the magnetic field proper in the discharge. On the basis of an adequate generalization of the theory of probes are interpreted probe characteristics obtained under different conditions. The existence of 5 effects is established which are produced by the magnetic field and which are recorded by the probes. The direct effect of the action of the magnetic field on the plasma can cause a change of the potential at a given point of the plasma, a change of the concn. of the electrons and ions, a change of the electron temp. and the mean energy of the ions, and a change of the function of the distribution of the electrons and ions according to their velocities. There is also in the plasma the effect of the action of the magnetic and of the elec. fields near the probe in the region of the mean free path of the electron. This d-effect, which distorts the probe characteristics owing to the action of the magnetic field in the neighborhood of the probe within the mean free path of the electrons, was studied in detail. Errors of some authors giving incorrect interpretation of the reading of the probes in a magnetic field are pointed out. Nine references.

W. R. Henn

Influence of a magnetic field on the potential gradient in plasma. E. Reikhrudel and G. Spivak. *Compt. rend. acad. sci., U. R. S. S.* 18, 177-9 (1938).—Although there are regions where the potential gradient changes in a magnetic field are insignificant, these changes sometimes reach 50-60%. The influence of a uniform longitudinal field on Hg vapor, Ne and A has been examd. A quant. theory of plasma must be developed before these effects on the gradient can be interpreted completely. B. C. P. A.

Ionization by collisions of the second kind in a gas discharge. A. A. Zaitsev and E. M. Reikhrudel. *Uspekhi Fiz. Nauk* 20, 447-68(1938).— From exptl. data on He, Ne and A, Z. and R. conclude that collisions of the second kind play an important and at times a predominant role in detg. the spectral and elec. characteristics of a discharge.
F. H. Rathmann

REYKHRUDEL', E. M.

"On the Drift of Electrons in Plasma," Zhur. Eksper. i Teoret. Fiz., 9, No. 2, 1939; Lab. Electrical Phenomena in Gases, Sci. Research Inst. Physics, Moscow State Univ., -1938-.

REYKHRUDEL', E. M.

"The Contraction of Plasma in a Magnetic Field," Dok. AN, 28, No. 7, 1940. State Univ. of Moscow. Cathedra in Electronic and Ionic-Power Physics. c1940-.

C A

PROCESSES AND PROPERTIES INDEX

3

Plasma of a gaseous discharge in a strong longitudinal magnetic field. R. H. Rathbruek and G. V. Spivak. *J. Exptl. Theoret. Phys.* (U. S. S. R.) 4, 211-25(1941); *J. Exptl. Theoret. Phys.* (U. S. S. R.) 10, 1406-21(1940); cf. *Ibid.* 9, 167 (1939). Exptl. data for the effect of a homogeneous magnetic field on the distribution of the electron current and concn. along the radius of the discharge tube are given for Hg and A at pressures from 10^{-3} to 1.0 mm. The ions and electrons are concd. along the axis of the tube.

F. H. Rathmann

A S a - S L A   METALLURGICAL LITERATURE CLASSIFICATION

C A   3

Method for studying directed currents in a gaseous discharge. E. M. Reikhrudel and T. A. Titova (Sci. Research Inst. Phys., Lomonosov State Univ., Moscow). Zhur. Tekh. Fiz. 17, 1421-30(1947).—Current distribution in a discharge tube was studied with the aid of 2 radially movable probes and an anode disk divided into several concentric, mutually insulated rings. At c.ds. of 1-5 amp./sq. cm., the radial distribution of c.d. and the electron concn. in the pos. column followed a zero-order Bessel function. At lower c.ds., the radial distribution of electrons in the pos. column of a glow discharge in A departed considerably from a Bessel function. At low currents, the potential gradient in the pos. column increased with current.   Cyrus Feldman

USSR/Electricity - Electromagnetism   Jul 51

"Positive Column of Gaseous Discharge in Nonhomo-
geneous Magnetic Field With Axial Symmetry,"
E. M. Reykhrudel, Phys Faculty, Moscow imeni
Lomonosov

"Zhur Tekh Fiz" Vol XXI, No 7, pp 733-745

(Material for this article was taken from author's
dissertation in Moscow in 1940.) Effect of ex-
ternal nonhomogeneous magnetic fld on electron
motion in plasma of glow and arc discharge at var-
ious currents and various pressures was studied.
Tests were processed by generalized sounds and

189T35

USSR/Electricity - Electromagnetism   Jul 51
                    (Contd)

simultaneously by split anode. Found: redistri-
bution of electron flow in plasma according to
directions; redistribution of electron density
and disturbance of distribution function of elec-
trons according to velocities and change in temp.
Author was assisted by Prof G. V. Spivak. Sub-
mitted 25 Jun 50.

189T35

USSR/Electronics - X-Ray Tube   Jul 51

"Oscillographic Study of Discharge in Pulse X-Ray Tubes," E. M. Reykhrudel, A. A. Sanin, T. A. Titova, Chair of Electron Optics and Oscillography, Moscow State U

"Zhur Tekh Fiz" Vol XXI, No 7, pp 746-752

Pulse oscillograph with delayed sweep and recording speed of 40 km/sec, built by authors, was used to study pulse X-ray cold-cathode tube operating at 100 - 300 kv. Oscillograms showed oscillation at frequency $\sim 10^7$ cycles and region of slow current

USSR/Electronics - X-Ray Tube (Contd)   Jul 51

rise. Effects of gas within tube and of parameters of circuit scheme are demonstrated. Authors were assisted by student A. V. Kustora. Submitted 25 Jun 50.

189T41

189T41

REYKHRUDEL, E. M.

USSR/Physics - Electric Discharge   Dec 52

"Impeded Discharge in a Magnetic Field With a Special
Confjguration of Discharg Gap," E. M. Reykhrudel,
A. V. Chernyshevskiy, V. V. Mikhnevich, I. A. Vasil'-
yeva

"Zhur Tekh Fiziki" Vol 22, No 12, pp 1945-1965

Electrons were subjected to simultaneous action of
nonhomogeneous elec and axially symmetric magnetic
fields. External magnetic field affects potential
of ignition. Oscillographic observations revealed
periodic and chaotic oscillations in the discharge.
The mechanism of discharge at low pressure is dis-
cussed. Received 16 Jul 52.

PA 240T100

USSR/Physics - High Vacuum Technique   Sep 53

"Standard High-Vacuum Combination Apparatus for the
New Building of Moscow University," P. K. Oshchepkov,
E. M. Reykhrudel' and T. N. Stasyuk

Vest Mos Univ, Ser Fizikomat i Yest Nauk, No 6,
pp 65-77

The article is in 6 parts. The first sets forth
the requirements of high vacuum apparatus and gives
a general description of types TVU-I, II, III and
IV. Part 2 describes the TVU-I in detail and
explains how it fulfills its requirements. Part 3

275T103

describes schematically the vacuum communications
of TVU-I. Parts 4 and 5 deal with different
types of valves employed in high vacuum apparatus.
Part 6 reviews all the good qualities of the
apparatus and lauds its constructors. Presented
10 Jul 1952

REYKHRUDEL', E.M.; CHERNETSKIY, A.V.; MIKHNEVICH, V.V.; VASIL'YEVA, I.A.

Mechanism of discharge in a magnetic ionised manometer. Vest.Mosk.un. 8
no.8:87-100 Ag '53.   (MLRA 6:11)

1. Fizicheskiy fakul'tet.
                  (Electric discharges through gases) (Manometer)

OSHCHEPKOV, P.K.; REYKHRUDEL', E.M.; STASYUK, T.N.

Standard combination high-vacuum apparatus for the new building of the Moscow
University. Vest.Mosk.un.8 no.9:65-77 S '53.

(MLRA 6:11)

(Vacuum pumps)

REYKHRUDEL', E. M.
USSR/Nuclear Physics - Ion sources

FD-671

Card 1/1   : Pub. 129 - 6/25

Author   : Reykhrudel', E. M.; and Chernetskiy, A. V.

Title   : Certain characteristics of a gas discharge source of ions

Periodical   : Vest. Mosk. un., Ser. fizikomat. i yest. nauk, Vol. 9, No 3,
                  47-54, May 1954

Abstract   : The authors describe a gas-discharge ion source in which the ions
                  are obtained from a low-pressure impeded glow discharge under
                  the action of an axially symmetric electric field, and in which
                  use is made of a gap having a particular shape that brings about
                  electron oscillations and hence effective ionization of the gas.
                  The ions are emitted through an aperture in the cathode and are
                  already directional in the discharge. The characteristics of
                  the ion current as a function of the various parameters and the
                  role of the electron-optical system are investigated. Refer to
                  A. Guthrie and W. Wakerling's "Characteristic of electrical
                  discharges in magnetic fields," Nat. Nuclear Energy Ser., 5,
                  1949

Institution   : Chair of Electron Optics

Submitted   : July 11, 1952

REYKHRUDEL', Ye. M.

USSR.

537.525

6173. Elementary processes in the formation of the high voltage impulse discharge at low pressures. E. M. REYKHRUDEL', A. V. KUSTOVA AND A. G. ZHUKOV. Zh. tekh. Fiz., 24, No. 7, 1179–86 (1954) in Russian.

An oscillographic investigation was carried out of the impulse discharge at 50–110 kV, pressures 10^{-4}–10^{-1} mm Hg in helium argon, air and mercury vapour. The electrode distance varied between 5 and 17 cm. The relation between time of formation of the discharge and peak value of the current on one hand, and various influencing factors, enabled two specific characteristics of the discharge type to be distinguished, viz. the emergence during the first stage of the discharge of a space charge which has a density varying along the discharge tube and having a maximum at the cathode, and therefore leading to the formation of the cathode parts of the discharge already during the first stages of its development, and, secondly, that the greatest influence on the formation of a discharge of high current density has, during the initial as well as during the following phases, the compensation of the negative space charge by positive ions all over the discharge space. A plasma is formed during the second stage of the discharge in a pressure range which depends on the nature of the gas.

B. F. KRAUS

REYKHRUDEL', E.M.

KUSTOVA, A.V.; REYKHRUDEL', E.M.

Gas focusing beams as a transition stage in the formation of
high-voltage impulsive discharges at low temperatures. Zhur.
tekh.fiz. 24 no.12:2183-2189 D '54.   (MLRA 8:2)
        (Electric discharges through gases)

REYKHRUDEL , E.M

USSR/Electronics - Vacuum Techniques   H-9

Abs Jour : Ref Zhur - Fizika, No 3, 1957, No 7193

Author   : Reykhrudel, E.M., Smirnitskaya, G.V., Borisenko, A.I.
Title   : Ionic Pump with Cold Electrodes and Its Characteristics

Orig Pub : Radiotekhn. i elektronika, 1956, 1, No 2, 253-259

Abstract : An investigation was made of the absorption of gases in an
           electric discharge by cold cathodes, placed in a longitudinal
           magnetic field at a pressure 10^{-2} -- 10^{-8} mm mercury, voltages
           up to 4.5 kv, and magnetic field intensities of 350 -- 1,000
           oersted, for air, neon, and helium. The smaller pump-out
           velocity in the case of neon and helium is attributed to
           weaker cathode spattering in these gases. The optimum ratios
           between the applied voltages and the intensity of the magne-
           tic field have been chosen experimentally. It is shown that
           the anode material does not play a substantial role, and that
           the best results are obtained with cathodes made of tantalum,
           molybdenum, and nioblum. The distribution of the current
           density on the surface of the cathode is investigated, and
           it is shown that in the cathode-spattering process the greatest

Card   : 1/2

REYKHRUDEL', Ye. M.

621.385.032.21 : 637.583

2987. PROPERTIES OF AN INDIRECTLY HEATED COLD CATHODE IN LOW-PRESSURE PULSE DISCHARGES. E.M.Reikhrudel', A.G.Zimelev and A.V.Kustova. Izv. Akad. Nauk SSSR, Ser. fiz., Vol. 20, No. 10, 1153-61 (1956). In Russian.

Microscopical observation of the cathode surface, oscillograms of currents and voltages in the space between the heating electrode and the cathode and in the main discharge, and measurement of the X-ray focus on the anode surface were the three methods used in the investigation of pulse discharges at 3-100 kV and 10^{-3}-10^{-4} mm Hg. The currents were of the order 1 kA, the current densities up to 10^6 A/cm². The arrangement was found to be satisfactory for pulse equipment.
                                        Electrical Research Association

GROSHKOVSKIY, Yanush [Groszkowski, Janusz], prof., Dr.inz.; BULAT, V.L.,
dotsent [translator]; REYKHRUDEL', E.M., prof., red.; TELESNIN,
N.L., red.; GRIBOVA, M.P., tekhn.red.

[High-vacuum technology] Tekhnologiia vysokogo vakuuma. Pod red.
E. M. Reikhrudelia. Moskva, Izd-vo inostr.lit-ry, 1957. 539 p.
(Vacuum)   (MIRA 12:2)

Rey Khrudel, E.M.

AUTHORS: Smirnitskaya, G.V., and E.M. Reykhrudel'   109-10-15/19

TITLE: Kinetics of the Electrons in a Discharge in Magnetic Fields at Low Pressures (O kinetike elektronov v razryade v magnitnom pole pri nizkikh **davleniyakh**)

ABSTRACT: The discharge device considered is a low-pressure tube having a ring anode and two disc cathodes situated at equal distances from the anode; radius of the anode is r_a and the anode-cathode distance is d. The device is situated in a magnetic field H (see Fig.1, p.1303). It is shown that the static potential in the inter-electrode space is given by Eq.(1) where U_a is the anode potential and U_o is the potential at the centre of the tube (i.e. at the origin of the co-ordinates). The equation is in good agreement with the experimental results, as can be seen from the curve of Fig.1. If it is assumed that the pressure is very low (of the order of 10^{-5} to 10^{-8} mmHg) the electron motion in the tube can be assumed to be independent of the space charge and the operation of the tube, in particular, the electron trajectories, can easily be analysed. The motion of the electrons can be described

Card1/3

Kinetics of the Electrons in a Discharge in Magnetic Fields at Low
·Pressures.

by Eqs. (2), (3) and (4), which are subject to the following
boundary conditions: an electron has initial velocities
$\dot{z}_0$ and $\dot{r}_0$ in the direction of the z and r axes, respec-
tively.
Solution of Eq.(2) shows that an electron is subject to a
harmonic motion in the direction of the axis z , while in
the plane $r\theta$ there are three solutions. At magnetic fields
greater than a certain critical value H_{kp} , the electron is
subject to both a rotation and a harmonic motion (see Fig.2a);
the solutions for this case   are given by Equations
(5) and (6). For magnetic fields equal to or lower than
H_{kp} , the electron trajectories are in the form of an expon-
ential spiral (see Fig.2б). From the above, it is concluded
that a glow discharge cannot exist in the tube at magnetic
fields lower than H_{kp}. This result was confirmed by some
experiments which showed that at U_a = 3 000 V , p = 10^{-6} mmHg,
no discharge could be obtained at magnetic fields less than
Card2/3 200 Oe.

109-10-15/19

Kinetics of the Electrons in a Discharge in Magnetic Fields at Low Pressures.

There are 2 figures, 1 table and 6 references, 1 of which is Slavic.

ASSOCIATION: Physics Faculty of the Moscow State University im. M. V. Lomonosov (Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im. M. V. Lomonosova)

SUBMITTED: May 15, 1957

AVAILABLE: Library of Congress

Card 3/3

REYKHRUDEL, E. M.

IONIZATION METHODS FOR DEVELOPING HIGH VACUUM.
E. M. Reikhrudel and O. V. Smirnitskaya (Lomonosov
Moscow State Univ.). Priroda 46, 87-91(1957) Sept. (In
Russian)

Descriptions and designs are given for ion pumps with
incandescent cathodes working on the gas ejection princi-
ple and with cold cathodes working on the gas absorption
principle. (R.V.J.)

REYKHRUDEL', E.M.; SMIRNITSKAYA, G.V.

Static and dynamic characteristics of a discharge connected with
oscillating electrons in a magnetic field. Izv.vys.ucheb.zav.;
radiofiz. 1 no.2:36-44 '58.   (MIRA 11:11)

1. Moskovskiy gosudarstvennyy universitet.
             (Electric discharges through gases)

REYKHRUDEL', E.M.; SMIRNITSKAYA, G.V.

Special features in the ignition of a discharge in a high vacuum located in a magnetic field. Izv.vys.ucheb.zav.; radiofiz. 1 no.2:45-50 '58. (MIRA 11:11)

1. Moskovsky gosudarstvennyy universitet.
(Electric discharges through gases)

9(4)
AUTHORS: Smirnitskaya, G.V. and Reykhrudel',E.M.   SOV/55-58-2-16/35

TITLE: Kinetics of Electrons in the Electromagnetic Field of a
                Magnetic Ionization Pressure Gauge and of an Ion Pump
                (Kinetika elektronov v elektromagnitnom pole magnitnogo
                ionizatsionnogo manometra i ionnogo nasosa)

PERIODICAL: Vestnik Moskovskogo Universiteta. Seriya matematiki, mekhaniki,
                astronomii, fiziki, khimii,   1958,Nr 2,pp 121-152 (USSR)

ABSTRACT: The paper contains a theoretical investigation of the
                motion of electrons in a magnetic longitudinal field and
                a nonuniform electric field. The fields correspond about
                to the field distribution in an ionization manometer and in
                an ion pump. The calculation does not consider the spatial
                charge and holds only for the relations before the ignition
                and for the burning discharge under low pressure
                (10^{-6}-10^{-8} mm Hg). Under these suppositions the cathode range
                extends over the whole discharge interval, and the influence
                of the volume charges on the electron motion can be neglected.
                The investigation of the kinetics of charged particles in
                the conditions chosen in the vacuum permits to explain how
                the discharge develops in the magnetic field under low

Card 1/2

Kinetics of Electrons in the Electromagnetic Field   SOV/55-58-2-16/35
of a Magnetic Ionization Pressure Gauge and of an Ion Pump

pressure and how large the values E and H have to be for a
pressure of $10^{-6} - 10^{-7}$ cm Hg, in order for a discharge
to take place.
There are 18 references, 7 of which are Soviet, 2 French,
and 9 American.

ASSOCIATION: Kafedra obshchey fiziki dlya biologo-pochvennogo i dr.f-tov
(Chair of General Physics of the Faculty of Soil Biology
and other Faculties) [Moscow Univ.]

SUBMITTED: June 24, 1957

Card 2/2

Reykhrudel, E.M.

24.2120

66702

SOV/109-4-8-22/35

AUTHORS: Granovskiy, V.L., Luk'yanov, S.Yu., Spivak, G.V., and Sirotenko, I.G.

TITLE: Report on the Second All-Union Conference on Gas Electronics

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 8, pp 1339 - 1358 (USSR)

ABSTRACT: The conference was organized by the Ac-Sc-USSR, the Ministry of Higher Education and Moscow State University.
T.B. Pogil'son - "Methods of Reducing the Energy Lost in the Formation of a Breakdown".
L.I. Pivovar and V.I. Gordiyenko - "Microdischarges and Pre-breakdown Currents Between Metal Electrodes in High Vacuum".
V.A. Simonov and G.P. Katukov - "Investigation of the Processes of Initiation and Development of a High-voltage Discharge in Vacuum".
A.M. Reykhrudel and G.V. Smirnitskaya - "The Character-istics of Ignition in High-vacuum in Magnetic Fields".
L.F. Taragan et al. dealt with the transfer of the electrode material during the pre-breakdown stage in vacuum.
M.B. Rusanov et al. - "The Motion of Micro-particles of Substances During Electric Breakdown in Vacuum".
The third section dealt with the problems of electric sparks, corona and the practical applications. It was presided over by I.S. Stekol'nikov. The following papers were read:
V.I. Levitov et al. - "Probe Investigation of the a.c. Corona Fields".
G.N. Aleksandrov - "Elementary Processes in the Ionization Zone of Corona-type Conductors at Atmospheric Pressures".
L.A. Dumskin - "Appearance of a Corona Discharge in Hydrogen and Nitrogen".
P.M. Chistyakov et al. - "Some Properties of the Corona Discharge in Hydrogen in Coaxial, Cylindrical System".
A.S. Boguslav and B.M. Klyarfeld - "Appearance of Discharge Phenomena Between a Point and a Plane at Gas Pressures of 10^{-3} - 1.0 mm Hg".
L.A. Repev et al. - "Methods of Unipolar Ionization of Air By Means of Aero-Ionisers (see p 1335 of the journal).
M.P. Vanyukov et al. - "Time Spectra of the Radiation of a Spark Discharge in Inert Gases" (see p 1284 of the journal).
M.P. Vanyukov and A.A. Mak - "Production of High Temperatures by Means of Spark Discharges".
V.A. Fabrikant - "Influence of the Magnetic Field of the Electric Discharge on the Dividing Surface of Two Media".
I.S. Stekol'nikov - "New Data From the Study of Long Sparks".
M.I. Simonov - "Properties of the Breakdown of Compressed Air in a Comparatively Uniform Field in the Presence of Localised Non-uniformities".
A.A. Vorobyev et al. - "Pulse and Oscillographic Techniques for the Measurement of the Discharge Lag in Dielectrics" (see p 1257 of the journal).
A paper by B.M. Zolotykh dealt with the problem of the basic theory of the electric erosion (see p 1330 of the journal).
The fourth section was presided over by S.Yu. Luk'yanov and was concerned with the non-stationary and low-frequency discharges. The following papers were read:
I.G. Nakrashevich and A.A. Labud - "The Nature of the Current Interruption During the Electric Explosion of a Metal Wire".
V.A. Simonov - "Propagation of Plasma From Local Pulse Source".
G.G. Timofeyev et al. - "Observation of an Electro-dynamically Compressed Arc By Means of an Electron-optical Converter".
M.M. Kuffel and Ya.I. Yushmanov - "Investigation of the Radial Electric Field in an Ion Magnetron".
V.A. Bobysater and N.K. Ranyovskiy - "Experiments with an Electron Model of a System with Magnetic Samples".
A.M. Andrianov et al. - "Distribution of Magnetic and Electric Fields in Powerful Pulse Discharges".
G.M. Marolov (England) - "Spectroscopic Determination of the Plasma Temperature in the "Zeta" Equipment" (see p 1326 of the journal).
The paper by Harding aroused a lot of interest and Academician L.A. Artsimovich expressed the opinion that the electron and ion temperatures of the "Zeta" should be of the same order; instead, according to Harding, the electron temperature ... an order than that ...

Card 7/19

Rey KHRuDeL', E.M.

64702

24(3/20)

SOV/109-4-8-22/35

AUTHORS: Granovskiy, V.L., Luk'yanov, I.Yu., Spivak, G.V. and
Sirotenko, I.G.

TITLE: Report on the Second All-Union Conference on Gas
Electronics

PERIODICAL: Radiotekhnika i elektronika, 1959, Vol 4, Nr 8,
pp 1339 - 1358 (USSR)

ABSTRACT: The conference was organized by the Ac.Sc.USSR, the
Ministry of Higher Education and Moscow State University.
A.A. Timofeyev - "Measurement of the Gas Density During
the Dynamic Operation of a Discharge" (see p 1306 of
the journal).A.V. Nedospasov - The Nature of a Striated
Positive Column".
V.I. Perel' and Yu.M. Kagan - "The Theory of Probes for
Arbitrary Pressures".
Yu.M. Kagan et al. - "The Positive Column of a Discharge
in a Diffusion Regime".
M.Ya. Kaynukov - "Influence of the Processes of the
Annihilation of the Negative Ions on Their Concentration
in the Column".
M.D. Gaborich and L.L. Pasechnik - "Anomalous Scattering,
Excitation of Plasma Oscillations and Plasma Resonance".
Ve.L. Klimontovich - "Energy Loss by Charged Particles for
the Excitation of the Oscillations in Plasma (the Langmuir
paradox)" and "The Theory of Non-linear Plasma Oscillations".
Ie.G. Martinkov and I.G. Nekrashevich - "Dependence of
the Temperature in the Near-electrode Region of a Pulse
Discharge on the Material of the Electrodes".
V.A. Metalins and E.M. Klyarfeld - "Formation of Light
Spots on the Anode of a Gas Discharge (see p 1301 of
the journal).
M.A. Matveyeva - "Distribution of Binary Mixtures of Inert
Gases in a d.c. Discharge".
V.G. Stepanov and V.P. Zakharchenko - "Some Phenomena
in Rarified Plasma".
V.G. Stepanov and V.S. Bazeli - "The Possibility of
Obtaining Highly Concentrated Plasma".
G.V. Spivak et al. and E.M. Reykhrudel' - "Some Character-
istics of the Discharge in an Ion-beam and in a Magnetic
Ionization Vacuum Gauge".
Yu.T. Rucharenko and O.K. Nazarenko - "Properties of
a Discharge with Electron Oscillations in a Magnetic
Field" (see p 1253 of the journal).
The paper by L.M. Biberman and B.A. Veklenko considered
the approximate methods for determining the concentration
of atoms at the radiation level.
I.I. Sobelmann and L.A. Vaynshteyn read a paper on
"Non-stationary Theory of the Stark Broadening of the
Spectral Lines in Plasma".
M.A. Mazink and S.L. Mandel'shtam - "The Broadening
and the Shift of Spectral Lines in a Gas-discharge Plasma".
G. Lunt (England) - "The Kinetics of Electron Collisions
Leading to the Excitation of the Molecular Hydrogen in
a Hydrogen Discharge".
V.N. Kolesnikov et al. - "Some Properties of the Arc
Discharge in an Atmosphere of Inert Gases".
A.A. Mak and M.P. Kaynukov - "Production of High
Temperatures By Means of Spark Discharges".

SMIRNITSKAYA, G.V.; REYKHRUDEL', E.M.

Electric discharge with a cold cathode at low pressures in a
magnetic field. Zhur.tekh.fiz. 29 no.2:153-162 F '59.
(MIRA 12:4)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova.
(Electric discharges)   (Magnetic fields)

BENDRIKOV, G.A.; KRASNUSHKIN, P.Ye.; REYKHRUDEL', E.M.; POTEMKIN, V.V.;
    MUSTEL', Ye.R.; RZHEVKIN, K.S.; IVANOV, I.V.; KHARLAMOV, A.A.;
    TIKHONOV, Yu.V.; STRELKOVA, L.P.; KAPTSOV, L.N.; ORDANOVICH,
    A.Ye.; KHOKHLOV, R.V.; VORONIN, E.S.; BERESTOVSKIY, G.N.; KRASNO-
    PEVTSEV, Yu.V.; MINAKOVA, I.I.; YASTREBTSEVA, T.N.; SEMENOV, A.A.;
    VINOGRADOVA, M.B.; KARPEYEV, G.A.; DRACHEV, L.A.; TROFIMOVA, N.B.;
    SIZOV, V.P.; RZHEVKIN, S.N.; VELIZHANINA, K.A.; NESTEROV, V.S.;
    SPIVAK, G.V., red.; NOSYREVA, I.A., red.; GEORGIYEVA, G.I., tekhn.
    red.

[Special physics practicum] Spetsial'nyi fizicheskii praktikum.
Moskva, Izd-vo Mosk.univ. Vol.1. [Radio physics and electronics]
Radiofizika i elektronika. Sost. pod red. G.V.Spivaka. 1960.
600 p.
                                              (MIRA 13:6)
1. Professorsko-prepodavatel'skiy kollektiv fizicheskogo fakul'teta
Moskovskogo universiteta im. M.V.Lomonosova (for all except Spivak,
Nosyreva, Georgiyeva).
        (Radio)   (Electronics)

69902
S/109/60/005/04/016/028
E140/E435

9.3150

AUTHORS: Reykhrudel', E.M., Smirnitskaya, G.V. and
             Vasil'yeva, N.N.

TITLE: Certain Characteristics of Discharges in an Ion Pump
             and Magnetic Ionization Manometer

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol 5, Nr 4,
            pp 662-665 (USSR)

ABSTRACT: It was shown previously (Ref 1,2) that under certain
             conditions a series of sharply defined ionization regions
             may form in a low-pressure electric discharge with cold
             cathode in an external magnetic field. In the present
             article the volt-ampere characteristics of such discharges
             are presented and the ion-velocity distribution close to
             the cathode given together with a comparison of the
             processes accompanying ignition of the discharge in the
             magnetic field with processes in a vacuum arc. Drawn-out
             ignition was used (Ref 3), reaching several minutes,
             permitting measurement of pre-breakdown currents by a
             pointer instrument. Slow discontinuous increases of
             current were observed which, at a certain value of
Card 1/2   current, lead to sharp increase of the latter and the

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S/109/60/005/04/016/028
E140/E435

Certain Characteristics of Discharges in an Ion Pump and Magnetic
Ionization Manometer

ignition of the autonomous discharge.   This is
explained by the appearance of microdischarges and the
evolution of gas with ion bombardment from the active
sections of the cathode.   The range of ion energies in
the cathode region is approximately 250 V, occurring in
several groups, confirming the existence, under certain
conditions, of several ionization regions.   The initial
state of each breakdown in high vacuum in the presence
of a cold cathode is the formation of individual
emission centers on the cathode and the evolution from
them of gas and metal vapor under the action of ion
bombardment.   There are 3 figures and 6 references,
5 of which are Soviet and 1 English.

ASSOCIATION:Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo
            universiteta im. M.V.Lomonosova (Physics Department of
            Moscow State University imeni M.V.Lomonosov)

SUBMITTED: June 1, 1959
Card 2/2

20435

S/109/60/005/012/03_/035

E192/E382

9.3140 (2301, 1140, 1141)

AUTHORS: Vasil'yeva, M.N. and Reykhrudel', E.M.

TITLE: Influence of the Space Charge on the Kinetics of
             Electrons in a Longitudinal Magnetic Field

PERIODICAL: Radiotekhnika i elektronika, 1960, Vol. 5,
             No. 12, pp. 2065 - 2068

TEXT: The problem of electron kinetics in a discharge
between a ring anode and two cold cathodes symmetrically
situated on both sides of the anode in a longitudinal magnetic
field H was considered in a number of works (Refs. 1, 2)
without taking into account the space charge.   It was shown,
however, (Ref. 3) that even at small currents and pressures of
the order of 10^{-4} to 10^{-5} mm Hg space charges could appear which
change substantially the potential distribution in the discharge
gap.   In the following the problem of electron motion in the
longitudinal magnetic field H and a nonhomogeneous, axially-
symmetrical electric field is considered.   The potential
distribution of this field is described by the functions
$\varphi(z)$ and $\varphi(r)$, which take into account the presence of the
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Influence of the Space Charge on the Kinetics of Electrons in
a Longitudinal Magnetic Field

space charge.   The first function is expressed by

$$\varphi(z) = \frac{5\varphi_0}{d(6p - d)} (-z^2 + 2pz)$$ (1)

where   d   is the distance between a cathode and the plane of
        the anode,
     p   is the value of   z   at which the potential
        distribution curve has a maximum,
     φ_0 is the potential at the centre of the tube at
        z = d   in the absence of the space charge (p = d).
The second function is given by:

$$\varphi(r) = \frac{\varphi_a - K\varphi_0}{r_a(r_a - 2q)} (r^2 - 2qr) + K\varphi_0$$ (2)

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a Longitudinal Magnetic Field

where r_a is the radius of the anode ring,

q   is the value of r corresponding to the minimum
of $\varphi(r)$,

φ_a is the potential of the anode and

$K = (r_a - 2q)/(r_a - q)$.

The equations of motion in cylindrical coordinates are as
follows:

$$m\ddot{z} = e\frac{\partial\varphi}{\partial z} .$$ \hfill (3)

$$m(\ddot{r} - r\dot{\theta}^2) = e\frac{\partial\varphi}{\partial r} - \frac{er\dot{\theta}H}{c} .$$ \hfill (4)

$$m\frac{1}{r}\frac{d}{dt}(r^2\dot{\theta}) = \frac{e\dot{r}H}{c} .$$ \hfill 5)

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Influence of the Space Charge on the Kinetics of Electrons in a Longitudinal Magnetic Field

The solution of Eq. (3) for the condition $t = 0$, $z = z_o$ and $\dot{z} = \dot{z}_o$ is in the form:

$$z = A \sin(\omega t + \alpha) + p \qquad (6)$$

where:

$$\omega = \sqrt{\frac{10 \, e\varphi_o}{md(6p - d)}} \; ; \quad A = \sqrt{(z_o - p)^2 + \frac{z_o^2}{\omega^2}} \; ;$$

$$\mathrm{tg}\, \alpha = \frac{z_o - p}{\dot{z}_o} \, \omega \, .$$

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S/109/60/005/012/03./035
E192/E382

Influence of the Space Charge on the Kinetics of Electrons in a Longitudinal Magnetic Field

By investigating the above solution it is seen that the space charge leads to the formation of two types of electron oscillations along the axis z : 1 - nonharmonic oscillations with respect to the anode plane having a frequency ω_1 ;

2 - harmonic oscillations relative to the plane z = p corresponding to the maximum of $\varphi(z)$. The motion of an electron in the anode plane $r\theta$ in the presence of the space charge is also investigated. It is shown that the solution for r as a function of time is in the form of the following integral:

$$t = \int_{r_o}^{r} \frac{r\,dr}{\sqrt{-Ar^4 - 2Cr^3 + C_1 r^2 - B}} \tag{9}$$

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S/109/60/005/012/035/035
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Influence of the Space Charge on the Kinetics of Electrons in a Longitudinal Magnetic Field

This integral cannot be solved exactly but approximate solutions for the case of under-critical and over-critical magnetic fields are derived. An approximate equation for $\vec{\Theta}(t)$ is also given. From the analysis of these solutions it is found that an electron oscillates in the plane $r\Theta$ between r_1 and r_2 and, simultaneously, it rotates with a frequency which is not less than the Larmor frequency. The presence of the space charge leads to:
1) an additional contraction of the charge;
2) appearance of gyromagnetic oscillations whose frequency depends on the initial conditions r_o and $\dot{r}_o$, and

3) the possibility of resonance oscillations.

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E192/E382

Influence of the Space Charge on the Kinetics of Electrons in a Longitudinal Magnetic Field

There are 3 figures and 3 references: 2 Soviet and 1 non-Soviet.

ASSOCIATIONS: Fizicheskiy fakul'tet MGU (Physics Department of MGU)

Kafedra fiziki MAI (Chair of Physics of MAI)

SUBMITTED: April 2, 1960

Card 7/7

27289

S/181/61/003/008/019/034
B102/B202

24.7700

AUTHORS: Kamoldinov, M. G. and Reykhrudel', E. M.

TITLE: Photoconductivity and quantum yield in germanium under the
             action of X-irradiation

PERIODICAL: Fizika tverdogo tela, v. 3, no. 8, 1961, 2362-2368

TEXT: The authors describe studies of the effect of X-irradiation on the
electric conductivity (concentration, mobility, and lifetime of the carriers)
of a homogeneous germanium specimen by simultaneously measuring the Hall
effect and the conductivity as functions of the irradiation dose. The
specimens used were n-type germanium pieces (21.5·5.3·3.4 mm) with an ini-
tial resistivity of 17.44 ohm·cm and a diffusion length of 2.3 mm. Lead
contacts were applied to these specimens. The measurements were made in
glass tubes (10^{-4} mm Hg) in a field H = 5,000 oe. To reduce the surface
recombination rate the samples were etched in H_2O_2. X-irradiation was made
with a PYП-2 (RUP-2) device at 100, 150, and 200 kv. The doses were
measured by a PM-1M (RM-1M) device. The measurements were made at 65°C

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S/181/61/003/008/019/034
B102/B202

Photoconductivity and quantum ...

(constant). The X-ray absorption coefficient was determined from the blackening of an X-ray film. An MΦ-2 (MF-2) microphotometer was used for photometry. The following numerical results were obtained:

anode voltage	λ_{eff}, Å	absorption coefficients, measured			quantum yield number of electron-hole pairs	Pair formation energy, ev	τ, μsec
		μ_a	μ	μ_m			
100	0.248	$1.6 \cdot 10^{-22}$	7.15	1.34	18 · 830	2.66	1,220
150	0.165	$1.2 \cdot 10^{-22}$	5.51	1.03	27 · 400	2.74	1,350
200	0.062	$0.9 \cdot 10^{-22}$	4.15	0.775	41 · 040	2.44	1,550

μ_a, μ, and μ_m are the atomic, the linear ($\mu = [\ln I_1 - \ln I_2]/[d_2 - d_1]$) and the mass absorption coefficient, respectively. (μ was measured in two plane-parallel plates of the thicknesses d_1 and d_2). μ_a, μ, and μ_m were also cal-culated from the formulas $\mu_a = 2.64 \cdot 10^{-2} z^{3.94} \lambda^3$ and $\mu_a = A\mu/\varrho N = A\mu_m/N$ where ϱ is the specific density, N, Avogadro's number. The theoretical

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Photoconductivity and quantum ...

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values for 100-v anode voltage are higher, for 150 and 200 ev lower than
the experimental values. The carrier lifetime τ was determined from
formula $I = qF\tau/T$, where I is the photocurrent in the semiconductor, F the
number of excitations per sec, q the electron charge and T the time con-
sumed by a carrier to travel the distance between the electrodes. Con-
clusion: X-irradiation leads to a change of conductivity and of the
quantities by which it is determined; the absorption of X-ray quanta causes
the occurrence of additional bound states in the forbidden band as well as
an increase of the carrier lifetime and a "hyperlinearity". At a certain
minimum dose, saturation of photoconductivity occurs. The saturation value
of conductivity depends on the quantum energy and on the dose rate. With
equal quantum energy and equal absorbed dose it is approximately propor-
tional to the dose rate. The quantum yield is proportional to the energy
of the absorbed photon. Within the limits of measurement accuracy the
electron-hole pair formation energy is in agreement with the results ob-
tained by other authors. There are 4 figures, 2 tables, and 15 references:
12 Soviet-bloc and 3 non-Soviet-bloc. The three references to English-
language publications read as follows: A. Rose. Phys. Rev., 97, 322, 1955;
P. Rappaport. Phys. Rev. 93, 246, 1954; K. G. Mc-Kay. Phys. Rev. 84, 829,1951.

Card 3/4

27289

S/181/61/003/008/019/034
B102/B202

Photoconductivity and quan um ...

ASSOCIATION: Moskovskiy gosudarstvennyy universitet im. M. V. Lomonosova
(Moscow State University imeni M. V. Lomonosov)

SUBMITTED: October 19, 1960 (initially), March 11, 1961 (after revision).

Card 4/4

27176
S/057/61/031/009/016/019
B104/B102

26.2322

AUTHORS: Boym, A. B., and Reykhrudel', E. M.

TITLE: Initial stages of a pulsed discharge at low pressures

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 31, no. 9, 1961, 1127-1134

TEXT: The authors studied the ignition of a pulsed discharge in a cold-
cathode tube at initial pressures of 10^{-4}-10^{-6} mm Hg and initial voltages
of 30-60 kv. They conducted experiments to study the possibility of
prolonging considerably the time τ necessary for the development of a
discharge. They determined the parameters of the electron beam and the
duration of the electron-optical stage of the pulsed discharge by observing
the time dependence of current and voltage by means of oscilloscopes, and
by measuring the cross section of the beam. The cross section was
determined by measuring the dimensions of the X-ray source on the anode.
Fig. 1 shows a diagram of the experimental arrangement. From extensive
experimental material, the authors conclude: (1) In the pulsed discharge
in a low-pressure tube featuring a cold cathode with ignition device, the
development of a discharge is delayed under certain conditions. The delay

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S/057/61/031/009/016/019
B104/B102

Initial stages of a pulsed ...

depends on the parameters of the discharge and the degree of electrode degasification; ignition starts when the initial voltage lies below the ignition voltage. (2) The delay of ignition corresponds to the stage of pre-discharge pulses preceding the stage of the focused gas beam. The time of this preliminary stage of discharge with a given R_n (Fig. 1) can be varied in a wide range by regulating the discharge capacitance when the voltage applied lies below the ignition voltage. (3) This delay may be used for increasing the lifetime of the electron beam in the pulsed discharge from 1 μsec up to some milliseconds. (4) The current amplitude in the preliminary stage of discharge can be regulated by proper section of the resistance R_n; here, the duration of this stage also changes. (5) The time development of a discharge also decreases with increasing pressure. There are 5 figures and 9 references: 8 Soviet and 1 non-Soviet.

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta
              (Division of Physics of Moscow State University)

SUBMITTED: November 18, 1960

Fig. 1. Diagram of the experimental arrangement. Legend: (1) Blocks for starting the scanning, (2) scanning generators.
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REYKHRUDEL', E.M.; SMIRNITSKAYA, G.V.; SHERETOV, E.P.

High-frequency radiation of a discharge in an ion pump with cold
cathode. Radiotekh. i elektron. 7 no.10:1809-1815 O '62.
(MIRA 15:10)

1. Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta
im. M.V.Lomonosova i Ryazanskiy radiotekhnicheskiy institut.
(Electronics)

S/057/62/032/006/013/022
B108/B102

AUTHORS: Vasil'yeva, M. N., and Reykhrudel', E. M.

TITLE: Effect of a space charge on the motion of electrons in a
             Penning tube

PERIODICAL: Zhurnal tekhnicheskoy fiziki, v. 32, no. 6, 1962, 725 - 734

TEXT: The motion of electrons in a Penning tube (two cold disk cathodes placed symmetrically with regard to a ring anode) in a longitudinal magnetic field considered. The effect of a space charge is taken into account. It is shown that, owing to the space charge, regions of electron oscillation arise along the discharge axis. The frequency of these (harmonic or inharmonic) oscillations is of the order of 10^9 sec^{-1}. Frequency, amplitude, and character of these oscillations depend on the place z_0 at which the electron is produced in the discharge and also on the initial velocity $\dot{z}_0$ of the electron. If $A = \sqrt{(z_0 - p)^2 + \dot{z}_0^2/\omega^2}$ (where d is the distance between the cathode plane and the anode plane,

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B108/B102

Effect of a space ...

and where p represents the value at which the distribution curve of the magnetic potential $\varphi(z)$ has its maximum), then when $A > (d-p)$ the electron will perform inharmonic oscillations of a frequency less than that of the harmonic oscillations which arise in the absence of a space charge. If $A < (d-p)$ the electron will not reach the anode plane but will perform harmonic oscillations of a frequency greater than that without a space charge. The frequency is independent of the initial conditions. The critical magnetic field in the case of a space charge is always greater than the critical field without a space charge. The electron trajectories in the anode plane r are confined in the interval $r_1 \leqslant r \leqslant r_2$, where r_1 and r_2 are the positive roots of the equation $-Ar^4 - 2Cr^3 + C_1r^2 - B = 0$. Here r_1 and r_2 depend on the discharge parameters and on the initial conditions. This interval decreases and increases in proportion with r_0. A space charge also reduces this interval and causes the discharge to pinch. The frequency of the hydromagnetic oscillations depends on the initial conditions and is greater in the case with a space charge than without. There are 3 figures and 3 tables.

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Effect of a space ...

S/057/62/032/006/013/022
B108/B102

ASSOCIATION: Fizicheskiy fakul'tet MGU, Kafedra fiziki MAI (Physical
Division MGU, Department of Physics MAI)

SUBMITTED: July 17, 1961

Card 3/3

L 10489-63
AT/IJP(C)
EWT(1)/EWG(k)/BDS/ES(w)-2--AFFTC/ASD/ESD-3/SSD--Pz-4/Pab-4--
ACCESSION NR: AP3000567

S/0109/63/008/005/0845/0851

AUTHOR: Boym, A. B.; Reykhrudel', E. M.

TITLE: The operation of a cold multicathode with ignition under pulse conditions

SOURCE: Radiotekhnika i elektronika, v. 8, no. 5, 1963, 845-851

TOPIC TAGS: cold multicathode, high-voltage pulse, vacuum gap, total cathode current, emitting surface, multicathode

ABSTRACT: The technique of delaying the ignition of high-voltage pulse discharge in a high vacuum is utilized in the development of a cold multicathode. Two experimental tubes, one with four and the other with eleven igniting electrodes, were investigated. The tubes consisted of an anode, a multicathode, and high-voltage resistors. The multicathode consisted of a cathode and igniting electrodes isolated from the cathode by vacuum gaps and from each other by means of a ceramic lattice. The high-voltage resistors were connected in series with the corresponding electrodes. Sections of high-voltage cable with a resistance of 2 kohm were used as resistors. The pressure in the tube was maintained between 5 x 10^5 and 5 x 10^-6 mm Hg. In the tube with four igniting electrodes, an increase in the number of igniting gaps caused an increase in the total cathode

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ACCESSION NR: AP3000567

current, which is directly proportional to the numbers of gaps. When the ini-
tial voltage was 30 kv, the cathode current was equal to 15, 30, 45, and 60 amp
for one, two, three, and four gaps, respectively. A simultaneous breakdown in
all gaps was observed without any noticeable ignition delay in individual gaps.
A similar phenomenon was observed in the tube containing eleven electrodes. A
cathode current of about 160 amp with a pulse duration of 0.3 to 0.4 sec was ob-
served for all eleven gaps. The investigations showed that the application of
series resistors permits 1) an increase in the emitting surface of a cold cathode
resulting in a higher electron current with a large pulse duration; 2) the crea-
tion of electron streams with the required cross section; and 3) the obtaining
of currents with low-velocity dispersion of electrons and large current amplitudes.
Orig. art. has: 6 figures and 1 formula.

ASSOCIATION: Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta im.
M. B. Lomonosova (Faculty of Physics, Moscow State University)

SUBMITTED: 19Mar62   DATE ACQ: 30May63   ENCL: 00

SUB CODE: PH   NO REF SOV: 005   OTHER: 001

ss/
--rd /2

L 18486-63   EWT(1)/BDS/ES(w)-2   AFFTC/ASD/ESD-3/IJP(C)/SSD   Pab-4   RH
ACCESSION NR: AP3005513   S/0057/63/033/008/0996/1006

AUTHOR: Boyn, A.B.; Reykhrudel', E.M.

TITLE: Cold cathode electron gun with keep-alive electrodes

SOURCE: Zhurnal tekhnicheskoy fiziki, v.33, no.8, 1963, 996-1006

TOPIC TAGS: electron gun , pulsed electron beam

ABSTRACT: The pulsed operation of cold cathode electron guns with keep-alive elec-
trodes was investigated under a variety of conditions with the purpose of obtaining
large electron currents in a field free drift region beyond the anode. Two dis-
charge tubes were investigated. One employed a Heil gun (O.Heil and J.J.Ebers,Proc
IRE,38,645,1950) with a 9 mm opening in the anode and a movable collector. The oth-
er tube employed a Pierce gun described by S.N.Treneva (Radiotekhnika i elektronika,
2,7,925,1957) with a 10 mm aperture in the anode and a fixed collector located 22
mm beyond the anode. This tube was investigated both with and without magnetic fo-
cusing. Oscillograms of the anode and collector currents and the anode potential
were obtained by a technique described elsewhere by the present authors (ZhTF,31,9
1127, 1961). The use of magnetic focusing increased the total conductivity of the

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ACCESSION NR: AP3005513

Pierce gun in the predischarge surge phase by more than an order of magnitude over the value obtained by electrostatic focusing alone. Gases emitted by the electrodes under the influence of the keep-alive discharge produced a focusing effect which increased the current in the drift region over the space charge limited value by tens of times in the case of the Heil gun and by hundreds of times in the case of the Pierce gun with magnetic focusing. This gas focusing effect was less marked when the electrodes were first thoroughly outgassed. Nine oscillograms are repro- duced in the text. Orig.art.has: 3 formulas and 5 figures.

ASSOCIATION: Moskovskiy gosudarstvenny*y universitet, Fizicheskiy fakul'tet(Physics Department, Moscow State University)

SUBMITTED: 11Jun62   DATE ACQ: 06Sep63   ENCL: 00

SUB CODE: GE, SD   NO REF SOV: 012   OTHER: 007

Card 2/2

REYKHRUDEL', E.M.; SMIRNITSKAYA, G.V.

Modern ultrahigh vacuum techniques. Zhur. tekh. fiz. 33 no.12:
1405-1429 D '63.   (MIRA 16:12)

1. Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta.

L 27662-66   EWT(1)   IJP(c)   AT

ACC NR: AP6008291   SOURCE CODE: UR/0109/66/011/003/0532/0535

AUTHOR: Reykhrudel', E. M.; Sheretov, E. P.

ORG: Moscow State University (Moskovskiy gosudarstvennyy universitet)

TITLE: Current of a self-maintaining discharge at high vacuum in crossed electric and magnetic fields

SOURCE: Radiotekhnika i elektronika, v. 11, no. 3, 1966, 532-535

TOPIC TAGS: electric discharge, magnetron

ABSTRACT: The self-maintaining discharge in crossed electric and magnetic fields was theoretically studied by R. L. Jepsen (J. Appl. Phys., 1961, v. 32, no. 12) with an assumption that the negative space charge is distributed uniformly in the gap. The estimated current density exceeded experimental values by several times. The present article evaluates the discharge current with an allowance for a nonuniformly distributed space charge built up by the electron avalanches in the gap. A formula is developed for calculating the current density in amp/cm^2.torr. This formula exhibited good agreement with experimental results obtained from a cylindrical magnetron (7 mm between the cylinders; cathode-radius-to-anode-radius ratio, 0.7). "In conclusion, the authors wish to thank Graduate Student E. Isakayev for his part in the experimental work." Orig. art. has: 2 figures and 25 formulas.

SUB CODE: 09 / SUBM DATE: 27Jul64 / ORIG REF: 001 / OTH REF: 002

UDC: 538.311.001.24

Card 1/1

L 33399-66   EWT(d)/EWT(1)   IJP(c)

ACC NR: AP6015313   (A, N)   SOURCE CODE: UR/0057/66/036/005/0907/0912

AUTHOR: Ivanova, T. I.; Pustovalov, G. Ye; Reykhrudel', E. M.

ORG: Physics Department, Moscow State University im. M.V.Lomonosov (Moskovskiy gosudarstvennyy universitet Fizicheskiy fakul'tet)

TITLE: Solution of Laplace's equation for a Penning discharge gap

TOPIC TAGS: Penning discharge, electrostatic field, Laplace equation, mathematic method, approximate solution

ABSTRACT: Because of its practical significance in connection with design and study of Penning discharges, the authors calculate the electrostatic field of a charged cylinder of radius a and length 2L located midway between and with its axis perpendicular to two infinite parallel plane grounded electrodes separated by a distance of 2D. The problem is first solved rigorously by separation of variables in cylindrical coordinates r, θ z (origin of coordinates at the center of the cylindrical electrode), and a set of linear equations is derived from which the coefficients in the resulting expansion in a series of modified Bessel functions can be calculated. Because of the complexity of the calculations, a second, approximate, calculation technique is developed. This technique is based on the assumption of a particular relatively simple

UDC: 533.9

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L 33399-66
ACC NR: APG015313

form, suggested by results of electrolytic tank measurements, for the potential in the region r = a, L < z < D. The limiting cases L → 0 and L → D are discussed, and numerical calculations for the case L/D = 1/2 are presented and compared with results of electrolytic tank measurements. The approximate calculations are least accurate near the edge of the cylindrical electrode; in this region the error is 10-20 % when 10 terms of the series are employed and the error cannot be reduced below 5-10 % even by using many more terms. The errors decrease rapidly with decreasing r, and four terms of the series give an accuracy of 1 % in the region r < 4a/5. The first term alone of the series gives an accuracy of 1 % on the axis. Orig. art. has: 18 formulas, 3 figures, and 1 table.

SUB CODE: 20/   SUBM DATE: 06Jul65/   ORIG REF: 003/   OTH REF: 001

Card   2/2   JS

L 02276-67 EWT(1)

ACC NR: AP6025249   SOURCE CODE: UR/0057/66/036/007/1226/1232

AUTHOR: Reykhrudel',E.M.; Smirnitskaya,G.V.; Babertsyan,R.P.

ORG: Physics Department, Moscow State University (Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta)

TITLE: A new method for determining the potential distribution in a Penning discharge

TOPIC TAGS: gas discharge, Penning discharge, electric potential, potential distribution

ABSTRACT: The authors describe a new technique for determining the potential distribution in a Penning discharge, which they call the "ion-kinetic method", and present experimental data obtained by the new technique. The ion-kinetic method is based on the fact, shown by calculations of two of the present authors (ZhTF, 36, 1217,1966/ see Abstract AP6025248/), that ions originating on certain planes perpendicular to the axis of a Penning discharge reach the center of the plane cathode at angles depending on their radii of origin. To measure the radial distribution of potential in the Penning discharge one need merely measure the energies of the ions issuing in different directions from a hole in the center of the cathode and employ the appropriate equations, which are presented but not derived in the present paper. The most

Card 1/2   UDC: 533.9

L 02276-67

ACC NR: AP6025249

energetic ions issuing in a given direction originate on the central plane of the dis-
charge tube, and from the energies of the most energetic ions issuing in different
directions one can determine the radial distribution of potential on that plane. The
authors assert that the radial potential distributions on other planes as well as the
axial potential distribution can also be determined. Advantages of the ion-kinetic
method are that it involves no distortion of the field within the Penning tube and that
it can be employed over the wide pressure range from 10^{-3} to 10^{-11} mm Hg. The ion-
kinetic method was employed to measure radial potential distributions on the central
plane of a Penning tube having a 1 cm long 4 cm diameter cylindrical anode and plane
cathode 6 cm apart. Some 30 potential curves, recorded at different pressures, mag-
netic field strengths, and discharge currents are presented and discussed in some
detail. It is concluded that increasing the magnetic field strength hinders the escape
of electrons to the anode and increases the negative space charge, and that increasing
the pressure facilitates escape of electrons to the anode and reduces the negative
space charge. At the highest pressures (about 10^{-3} mm Hg) the space charge was neu-
tralized and the potential distribution was similar to that in a glow discharge. Orig.
art. has: 11 formulas and 3 figures.

SUB CODE:. 20   SUBM DATE: 06Jul65   ORIG. REF: 005   OTH REF: 003

Card 2/2   vmb

L 28483-66   EWT(1)

ACC NR: AP6013121   SOURCE CODE: UR/0057/66/036/004/0653/0660

AUTHOR: Reykhrudel', E. M.; Isakayev, E. Kh.

ORG: Physics Department, Moscow State University (Fizicheskiy fakul'tet Moskovskogo gosudarstvennogo universiteta)

TITLE: Ignition of discharge in a high vacuum Penning cell

SOURCE: Zhurnal tekhnicheskoy fiziki, v. 36, no. 4, 1966, 653-660

TOPIC TAGS: electric discharge, electric discharge ionization, ignition, electron oscillation, vacuum, longitudinal magnetic field

ABSTRACT: The authors employ the Townsend avalanche theory to calculate the ignition curve (the magnetic field strength at ignition as a function of the anode potential) for a Penning cell in a vacuum. It is assumed that the electrons leave the center of the cathode normally to its surface with negligible velocity and that they are so scattered in collisions with gas molecules that after collision their kinetic energy is evenly distributed between the longitudinal and radial directions. The radial velocity distribution of the electrons is taken approximately into account in calculating the first Townsend coefficient by dividing the electrons into two groups, the electrons in one of which retain and those in the other lose all their transverse velocity. It is assumed that the ionization takes place mainly within; the anode

Card 1/2   UDC: 537.525

L 28483-66

ACC NR: AP6013121 O

cylinder, where the potential is a quadratic function of the distance from the axis.
The solution of the radial equation of motion is taken from an earlier paper by G.V.
Smirnitskaya and E.M.Reykhrudel' (ZhTF, 29, 153, 1959). A number of ignition curves
recorded with Penning cells of different design at pressures from 10^{-4} to 10^{-7} mm Hg
are presented and their features are discussed in some detail with reference to the
theoretical formula. The theoretical formula provides qualitative explanation for a
number of features of the experimental curves. In one case good quantitative agree-
ment is shown between the portion of an ignition curve corresponding to anode poten-
tials higher than that for which the ignition field strength is minimum and the
theoretical curve calculated for a reasonable value of the secondary emission co-
efficient which, however, was selected to give the best fit. Orig. art. has:
23 formulas and 4 figures.

SUB CODE: 20   SUBM DATE: 07Jun65   ORIG. REF: 004   OTH REF: 001

Card 2/2 CC

ACCESSION NR: AP4038625   S/0109/64/009/004/0728/0734

AUTHOR: Reykhrudel', E. M.; Sheretov, E. P.

TITLE: Ignition of a discharge in high vacuum in a cylindrical magnetron with a cold cathode

SOURCE: Radiotekhnika i elektronika, v. 9, no. 4, 1964, 728-734

TOPIC TAGS: arc discharge ignition, cascade theory, Townsend discharge, magnetron, cold cathode magnetron, self maintaining discharge

ABSTRACT: An attempt is made to apply cascade theory to the determination of the conditions under which a self-maintaining discharge is ignited in a cylindrical magnetron whose internal cylinder serves as a cold cathode, under high vacuum conditions (10^{-5} - 10^{-9} mm Hg), where a discharge ignites as a result of electron oscillation in the crossed electric and magnetic fields. The Townsend criteria for discharge ignition are used to determine the theoretical anode-potential dependence of the magnetic field intensity at which the self-maintaining discharge occurs. A quadratic distribution of the potential along the radius is assumed. A general solution of the problem is obtained also for the case of an arbitrary distribution

Card 1/2

ACCESSION NR: AP4038625

of the potential along the radius in the discharge gap. The theoretical curves agree well with experiment. Orig. art. has: 5 figures and 5 formulas.

ASSOCIATION: None

SUBMITTED: 22Jan63   ENCL: 00

SUB CODE: EC, EM   NR REF SOV: 004   OTHER: 005

Card   2/2

GRIGOR'YEV, V.B.; GRIGOR'YEVA, L.A.; REYKHSEL'D, V.O.; MAKOVETSKIY, K.L.;
    SMIRNOV, N.I.

Separation of polymer homologous mixtures in a thermo-
gravitation column. Zhur.prikl.khim. 38 no.11:2592-2595
N '65.   (MIRA 18:12)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta.
Submitted January 17, 1964.

89996

S/190/61/003/003/013/014
B101/B204

15 8116

AUTHORS: Reykhsfel'd, V. O., Bondarenko, A. I.

TITLE: Accumulation of non-saturated compounds on dimethyl-methyl-
              polysiloxanes

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 3, no. 3, 1961, 487

TEXT: The present "Letter to the Editor" reports on the accumulation of
vinyl derivatives on dimethyl-methyl-polysiloxane of the general
formula

$$\left[\begin{array}{cc} CH_3 & CH_3 \\ | & | \\ (-Si-O)_{8.5} & -Si-O- \\ | & | \\ CH_3 & H \end{array} \right]_n \quad ; \quad n = 100 - 150.$$
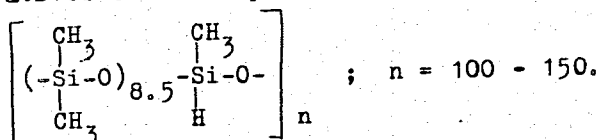
The polysiloxanes were obtained by means of copolymerization of octamethyl-
cyclotetrasiloxane with tetramethylcyclotetrasiloxane. Interaction of
this polymer with methylmethacrylate in the presence of 0.1 N H_2PtCl_6,
dissolved in isopropanol at 95°C after 3 hr resulted in a highly hydro-
phobic polymer, which is soluble in acetone, benzene and chloroform.
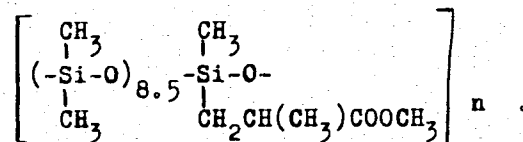Card 1/2

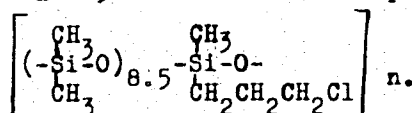Accumulation of non-saturated...

89996
S/190/61/003/003/013/014
B101/B204

On the basis of the analysis and of the infrared spectrum, the following
formula is ascribed to it:

$$\left[(-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{Si}}-O)_{8.5} -\underset{\underset{CH_2CH(CH_3)COOCH_3}{|}}{\overset{\overset{CH_3}{|}}{Si}}-O- \right]_n .$$

Accumulation of allyl chloride onto the initial polymer dissolved in
xylol, with the same catalyst at 150°C resulted in a polymer having the
structure

$$\left[(-\underset{\underset{CH_3}{|}}{\overset{\overset{CH_3}{|}}{Si}}-O)_{8.5} -\underset{\underset{CH_2CH_2CH_2Cl}{|}}{\overset{\overset{CH_3}{|}}{Si}}-O- \right]_n .$$

The authors find that they were the first to prove the possibility of
modifying linear highmolecular silicon-organic polymers by the accumula-
tion of vinyl monomers on the Si-H bond of dimethyl-methylpolysiloxane.

SUBMITTED: October 18, 1960

Card 2/2

23087

S/079/61/031/005/002/002
D222/D304

5.3100   2209

AUTHOR: Reykhsfel'd, V.O.

TITLE: Investigation in the region of mono-organic silanes
            I. Synthesis of mono-substituted silanes

PERIODICAL: Zhurnal obshchey khimii, v.31, no.5, 1961, 1576-1579

TEXT: In his experimental work the author used methods publi-
shed in Western literature for preparing di-and tri-substituted
silanes: one method makes use of the reaction of alkyltrichloro-
silanes with alkyl trisubstituted silanes, acting as hydrogen do-
nors in the presence of $AlCl_3$, according to the equation:

$$3R_3SiH + R'SiCl_3 \xrightarrow{AlCl_3} 3R_3SiCl + R'SiH_3$$
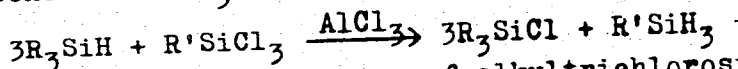
The second method consists of hydration of alkyltrichlorosilanes
with lithium hydride. $R\ SiCl_3 + 3LiH \rightarrow R\ SiH_3 + 3LiCl$. By the
first method the author prepared butylsilane from butyltrichloro-
silane with: 1) triethyl- 2) tributyl-and 3) tricsoamylsilanes

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S/079/61/031/005/002/002
D222/D304

Investigation in the region . . .

as H_2 donors; as well as isoamylsilane from isoamyltrichlorosila-
ne and tributylsilane. The yield of butylsilane was good decrea-
sing with the increase of molecular weights of reagents these
being 83; 73; 47 and 60% respectively. By the second method the
author prepared butyl phenyl, isoamyl and para chlorophenylsilanes.
The author states that while the first two compounds are known,
p-chlorophenylsilane is only mentioned in US patent literature(Ref.7:
Pat. SShA (US Pat.) no. 2762823; RZhkhim, 1959, 385) and isoamyl-
silane has not yet been described. He strongly emphasizes the
necessity of performing these syntheses in an atmosphere of pure
dry nitrogen on account of the explosive danger due to the pro-
duced SiH_4. The evolution of SiH_4 (a product of the side reactions
$2RSiH3 \rightarrow R_2SiH_2 + SiH_4$) is not considerable during alkylsilanes
synthesis but is quite appreciable during the preparation of aryl-
silanes; in the author's opinion this probably depends on the speci-
fic reactivity of the substitution groups, since it steadily

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23087

S/079/61/031/005/002/002
D222/D304

Investigation in the region . . .

decreases in the series: p-chlorophenyl-silane > phenylsilane > bu-
tylsilane. The author then gives details of his mono-substituted
silanes preparation as well as a description of p-chlorophenyl-
trichlorosilane as one of the initial reagents used. There are 8
references: 2 Soviet-bloc and 6 non-Soviet-bloc. The references
to the four most recent English-language publications read as fol-
lows: W. Nebergall, J. Am. Chem. Soc. 72, 4702, 1950; Pat. SShA
(US Patent) no. 2537763, Ch. A. 45, 3409, 1951; F. Whitmore, E.
Pietrusza, L. Sommer, J. Am. Chem. Soc, 69, 2108, 1947; Pat SShA
(US Patent) no. 2762823, RZhKhim, 1959, 385.

ASSOCIATION: Leningradskiy tekhnologicheskiy institut im. Lenso-
veta (Leningrad Institute of Technology im. Lensovet)

SUBMITTED: July 8, 1960

Card 3/3

25366

S/079/61/031/008/004/009
D215/D304

5.3700

AUTHORS: Reykhsfel'd, V.O. and Prokhorova, V.A.

TITLE: Study in the field of mono-organosilanes. (II) Reactivity of mono-organosilanes with alcohols

PERIODICAL: Zhurnal obshchey khimii, 1961, v. 31, no. 8, 2613-2618

TEXT: The reactions studied are generalized by the following equations:

$$RSiH_3 \xrightarrow[-H_2]{+R'OH} RSiH_2OR' \xrightarrow[-H_2]{+R'OH} RSiH(OR')_2 \xrightarrow[-H_2]{+R'OH} RSi(OR')_3$$
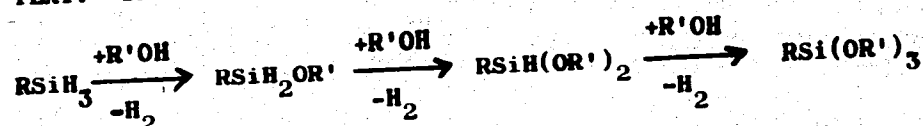
The alcohols studied were benzyl, propyl-, allyl- and propargyl- and the silanes, butyl-, phenyl-, n-chlorphenyl-. The kinetics of the reactions were followed by measuring the rate of H_2 liberation in the reaction catalyzed by a strictly determined amount of freshly deposited Cu,

Card 1/2

32345
S/190/62/004/001/006/020
B101/B110

15 6170

AUTHORS: Reykhsfel'd, V. O., Ivanova, A. G.

TITLE: Synthesis of linear dimethyl methyl polysiloxanes by
             copolymerization of cyclic siloxanes

PERIODICAL: Vysokomolekulyarnyye soyedineniya, v. 4, no. 1, 1962, 30-36

TEXT: Linear polymers containing reactive Si-H bonds were synthesized by
copolymerization of octamethyl cyclotetrasiloxane (I) with tetramethyl
cyclotetrasiloxane (II), or pentamethyl cyclopentasiloxane (III). I was
obtained by fractional distillation of the industrial product. Optimum
conditions for synthesizing II and III: 10-15 min hydrolysis of methyl
dichloro silane with ice in ethereal solution. Vacuum distillation of
liquid products (yield 93-94%) yielded up to 80% cyclic siloxanes, mainly
II and III, which were isolated by rectification. Copolymerization was
conducted at 100-110°C by 3% $Al_2(SO_4)_3 \cdot 2H_2O$ as catalyst with various ratios
of initial monomers. With 15% by weight of II in the initial mixture,
dimethyl methyl polysiloxane (molecular weight: 110, 800) containing
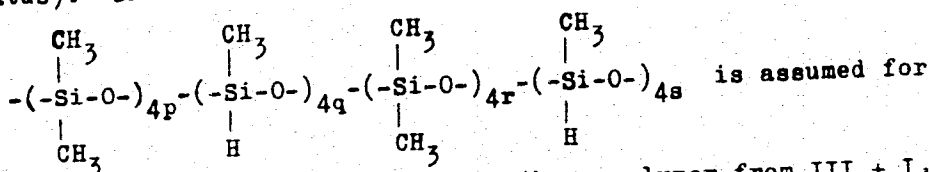21.68% by weight of Ch_3HSiO links was obtained after 8-11 hrs. After 30 hrs
Card 1/3

32345
S/190/62/004/001/006/020
B101/B110

Synthesis of linear dimethyl ...

10% by weight of III yielded the same polymer with a molecular weight of 84,620, containing 14.13% by weight of CH_3HSiO links. The degree of conversion was 30-65%. Fractional precipitation of the polymer from a benzene solution by CH_3OH yielded fractions of constant composition and a constant content of reactive hydrogen (determined by decomposition of the polymer dissolved in benzene by means of alcoholic KOH in the Tserevitinov apparatus). The structure

$$-(-Si-O-)_{4p} \overset{CH_3}{\underset{CH_3}{|}} -(-Si-O-)_{4q} \overset{CH_3}{\underset{H}{|}} -(-Si-O-)_{4r} \overset{CH_3}{\underset{CH_3}{|}} -(-Si-O-)_{4s} \overset{CH_3}{\underset{H}{|}} \quad \text{is assumed for}$$

the polymer obtained from II + I. For the copolymer from III + I, 4q and 4s are replaced by 5q and 5s, respectively. According to F. R. Mayo, F. M. Lewis (J. Amer. Chem. Soc., 66, 1594, 1944) the copolymerization constants were calculated to be $r_1 = 2.2 \pm 0.3$, $r_2 = 0.31 \pm 0.03$ for II + I; and $r_1 = 1.2 \pm 0.16$, $r_2 = 0.35 \pm 0.04$ for III + I. It is concluded that (1)

Card 2/3

REYKHSFEL'D, V.O.; MAKOVETSKIY, K.L.; YEROKHINA, L.L.

    Cyclic trimerization of acetylenes. Zhur.ob.khim. 32 no.2:653
    F '62.   (MIRA 15:2)

    1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta.
                        (Acetylene)

REYKHSFEL'D, V.O.; PROKHOROVA, V.A.

Calculation of rate constants for two-stage parallel and
consecutive second order reactions. Kin. i kat. 4 no.3:483-486
My-Je '63.   (MIRA 16:7)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta.
            (Chemical reaction, Rate of)

L 15604-63   EPF(c)/EWP(j)/EWT(m)/BDS   ASD   Pc-4/Pr-4   RM/WW

ACCESSION NR: AP3004704

S/0190/63/005/008/1183/1189

AUTHORS: Kogan, E. V.; Ivanova, A. G.; Reykhsfel'd, V. O.; Smirnov, N. I.; Gruber, V. N.

TITLE: Polymerization of octamethylcyclotetrasiloxane in the presence of acid catalysts

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 5, no. 8, 1963, 1183-1189

TOPIC TAGS: siloxane, polymerization, catalyst, sulfuric acid, potassium dichromate, potassium permanganate

ABSTRACT: The kinetics of octamethylcyclotetrasiloxane (OMCTS) polymerization by sulfuric acid in the presence of promoters was investigated by the conventional viscosimetric method and by an ultrasonic technique described in an earlier paper by E. V. Kogan, N. I. Smirnov, and A. P. Mozhayev (Zh. prikl. khimii, 34, 541, 1961). Into a 50-ml flask were placed 25 ml of OMCTS to which were added (under stirring) various amounts of sulfuric acid, potassium permanganate, or potassium dichromate solutions. It was found that the stirring frequency had no effect on the process. In the absence of oxidizers, 2% by weight of concentrated sulfuric

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L 15604-63

ACCESSION NR: AP3004704

acid resulted within a 6-8 hour interval in a maximum polymerization level (up to 90%) of the original OMCTS. Additional amounts of sulfuric acid increased only the conversion rate. Experiments showed that the dilution of the acid had a detrimental effect on the rate and yield of polymerization, as did the replacement of the sulfuric acid by oleum. A similar detrimental effect was observed when 0.03-1.6 gram-equivalent of potassium permanganate or 0.1-1.0 gram-equivalent of potassium dichromate was added per gram-equivalent of sulfuric acid, the degree of polymerization inhibition increasing with the amount of oxidant added. It was found that at 60C (in the presence of 1% concentrated sulfuric acid without oxidants) a polymerization level of 80% was reached within 4 hours, while at 20C it took 9 hours to achieve a 30% polymerization. Orig. art. has: 1 formula and 9 charts.

ASSOCIATION: Leningradskiy technologicheskiy institut im. Lensoveta (Leningrad Technological Institute)

SUBMITTED: 19Jan62   DATE ACQ: 28Aug63   ENCL: 00

SUB CODE: CH   NO REF SOV: 010   OTHER: 004

Card 2/2

PROKHOROVA, V.A.; REYKHSFEL'D, V.O.

Monoorganosilanes. Part 3: Syntheses based on monoorganosilanes.
Zhur. ob. khim. 33 no.8:2617-2626 Ag '63.   (MIRA 16:11)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta.

REYKHSFEL'D, V. O.; MAKOVETSKIY, K. L.

Mechanism of the cyclic trimerization of acetylenes on complex
organometallic catalysts. Dokl. AN SSSR 155 no. 2:414-417
Mr '64.   (MIRA 17:5)

1. Leningradksiy tekhnologicheskiy institut im. Lensoveta.
   Predstavleno akademikom A. A. Grinbergom.

ACCESSION NR: AP4040477   S/0190/64/006/006/0988/0993

AUTHORS: Grigor'yeva, L. A.; Reykhsfel'd, V. O.

TITLE: Alkyl(aryl)hydropolysiloxanes. 4. Reaction kinetics of unsaturated compounds with dimethylmethylhydropolysiloxanes

SOURCE: Vy*sokomolekulyarny*ye soyedineniya, v. 6, no. 6, 1964, 988-993

TOPIC TAGS: siloxane, silicone, alkyl(aryl)hydropolysiloxane, methylstyrene siloxane interaction, methylmethacrylate siloxane interaction, Speier catalyst, chloroplatinic acid catalyst, rate of interaction, autocatalytic reaction character

ABSTRACT: This is a continuation of earlier work by the authors (Vy*sokomolek. soyed. 6, 969, 1964), and deals with the kinetics of interaction of α-methyl-styrene and methylmethacrylate with dimethylmethylhydropolysiloxanes (DMMHPS) in the presence of chloroplatinic acid (Speier's catalyst). The rate of the process was determined by measuring the amount of active hydrogen which did not enter in the reaction. It was found that the addition process proceeded faster in an atmosphere of an inert gas than in oxygen, and that within a 3-20% concentration range of DMMHPS in α-methylstyrene the reaction rate remained practically constant.
Card 1/2

ACCCESSION NR: AP4040477

Experiments on the interaction of DMMHPS and α-methylstyrene at 30, 50, and 100C up to 160 minutes revealed that at 30C the reaction was practically dormant for the first 20 minutes. This fact the authors attribute to the time required for the reduction of chloroplatinic acid to platinum. In their opinion the reaction is of an autocatalytic character and proceeds in two stages. The first stage involves the formation of the catalyst, while during the second the vinyl derivative is linked to DMMHPS along the Si-H bond. It was found that the kinetics of the reaction satisfied an equation for a reaction of the first order and that the reactivity of α-methylstyrene considerably exceeded that of methylmethacrylate. The rate constants and the activation energies of the reactions were determined. Orig. art. has: 7 charts, 1 table, and 3 formulas.

ASSOCIATION: Leningradskiy tekhnologicheskiy institut im. Lensoveta (Leningrad Technological Institute)

SUBMITTED: 19Apr63   DATE ACQ: 06Jul64   ENCL: 00

SUB CODE: GC   NO REF SOV: 003   OTHER: 005

Card 2/2

MAKOVETSKIY, K. L.; REYKHSFEL'D, V. O.; YUROKHINA, L.L.

Simultaneous cyclic trimerization of butylacetylene with
phenylacetylene. Zhur. ob. Khim. 34 no.6:1968-1970 Je '64.
(MIRA 17:7)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta.

MAKOVETSKIY, K.L.; LEYN, B.I.; REYKHSFEL'd, V.O.

Cyclic trimerization of tert-butylacetylene. Zhur. ob. khim. 34
no.10:3505-3506 O '64.   (MIRA 17:11)

1. Leningradskiy tekhnologicheskiy institut im. Lensoveta.

L 25665-66   EWT(m)/EWP(j)/T   IJP(c)   RM

ACC NR: AM6008006   (A)   Monograph   UR/

Reykhsfel'd, Valeriy Orlandovich; YErkova, Lyubov' Nikolayevna

Equipment for organic chemicals synthesis and synthetic rubber pro-
cess industries. (Oborudovaniye proizvodstv osnovnogo organi-
cheskogo sinteza i sineteticheskikh kauchukov) Moscow, Izd-vo
"Khimiya," 1965. 623 p. illus., biblio., index. Errata slip
inserted. 4000 copies printed.

TOPIC TAGS: chemical plant equipment, organic chemical, synthetic
rubber, petrochemistry, food, pharmaceutics, equipment designs,
equipment operation, material balance, heat balance, process
automation

PURPOSE AND COVERAGE: This is a handbook for engineers, technicians
and designers concerned with organic chemicals' synthesis (monomers,
alcohols, acids, etc), synthetic rubber, petrochemical, food and
pharmaceutical process industries. It is suitable as a textbook
for students of chemical institutions of higher education and for
technicians. The book deals with the design and principles of
operation of equipment, and provides data for establishing ma-
terial and heat balances and for process automation. There are
254 Communist World and 60 Western references.

Card 1/2   UDC: 660.02

L 25665-66

ACC NR: AM6008006

TABLE OF CONTENTS

SUB CODE: 07,11/ SUBM DATE: 28oct65/ ORIG REF: 197/ OTH REF: 051

Card 2/2

REYKHSFEL'D, V.O.; PROKHOROVA, V.A.; IUDINA, V.A.

Calculation of rate constants for three-step parallel-consecutive reactions of second order. Kin. i kat. 6 no.1:171-176 Ja-F '65.
(MIRA 18:6)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta.

BUTOMO, S.V.; REYKHSFEL'D, V.O.; MAKOVETSKIY, K.L.

Synthesis of trimethylbenzenes for the measurement of natural radiocarbon by the scintillation method. Radiokhimiia 7 no.3:364-366 '65.

(MIRA 18:7)

REYKHSFEL'D, V.O.; PROKHOROVA, V.A.

Monoorganosilanes. Part 4: Reactivity of monoorganosilanes in the reaction with monocarboxylic acids. Zhur. ob. khim. 35 no.4: 693-697 Ap '65.   (MIRA 18:5)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta.

REYKHSFEL'D, V.O.; PROKHOROVA, V.A.

Monoörganosilanes. Part 5: Reaction kinetics of monoörganosilanes
with alcohols. Zhur. ob. khim. 35 no.10:1821-1825 O '65.
(MIRA 18:10)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta.

BEYER....AL'N, T.O.; PLOKHOROVA, V.A.

Monoörganosilanes. Part 6: Reaction kinetics of monoörganosilanes with phenols. Zhur. ob. khim. 35 no.10:1826-1829 O '65.

Monoörganosilanes. Part 7: Reactivity of monoörganosilanes in the interaction with amines. Ibid.:1630-1835   (MIRA 18:10)

1. Leningradskiy tekhnologicheskiy institut imeni Lensoveta.

L 10782-66   EWT(m)/EWP(j)   RM

ACC NR: AP6000007   UR/0080/65/038/011/2592/2594

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TITLE: Separation of polymer homologous mixtures in a thermogravitation-
al column

SOURCE: Zhurnal prikladnoy khimii, v.38, no.11, 1965, 2592-2594

TOPIC TAGS: silane, chemical separation, polymer

ABSTRACT: The article describes an attempt to apply a thermogravitation-
al column to the separation of some complex mixtures which cannot be
fractionated by other means, or only with great difficulty. In particu-
lar, the column was applied to polymer homologous mixtures obtained by
the addition of various unsaturated monomers to dimethylmethylhyropoly-
siloxanes, and also to the products of the cocyclotrimerization of
acetylenes--trisubstituted benzenes. The article gives a diagram of the
construction of the thermogravitational column. The distance between
plates was 0.3 mm, and the height of the working section of the column

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was 774 mm. The temperature difference between the walls of the column
was 30° in the separation of products obtained by the addition of olefins
to dimethylmethylhydropolysiloxanes, and 40° in the separation of mix-
tures of alkylarylbenzenes. Results of the experimental separations are
shown in tables. These data indicate that separation in a thermogravita-
tional column is well suited to separation of polymer homologous mixtures
of large molecules which differ only slightly in their structure, and can
also be recommended for the separation of very high boiling mixtures.
Orig. art. has: 1 figure and 2 tables.

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Card 2/2

L 07159-67   EWP(j)/EWT(m)   RM

ACC NR: AP6028169   SOURCE CODE: UR/0079/66/036/006/1069/1074

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TITLE: Studies in the field of monoorganosilanes. Part 9: Proton magnetic resonance study of association with dimethylformamide

SOURCE: Zhurnal obshchey khimii, v. 36, no. 6, 1966, 1069-1074

TOPIC TAGS: formamide, silane, NMR

ABSTRACT: The monoorganosilanes isoamyl-, n-hexyl- and phenylsilane were synthesized by reducing the corresponding trichlorosilanes with lithium hydride, and their reaction with dimethylformamide (DMF) was studied by means of high-resolution proton magnetic resonance (PMR) spectra. Associates of 1:1 composition were formed. On the basis of the PMR spectra it is postulated that a p_π-d_π conjugation of the phenyl ring with 3d levels of the silicon atom of the silyl group exists in phenylsilane. It was confirmed that phenylsilane in the free state is weakly self-associated. The nitrogen atom of the amide group of DMF takes part in the formation of the associative bond of $RSiH_3 \cdot DMF$. The bond is thought to be formed as a result of the competing interaction of the unshared electron pair of the nitrogen atom with vacant 3d orbitals of the silicon atom of the silane. The effect of diluting the associate with polar compounds was studied on phenylsilane; it is postulated that the decisive factor in the interac-

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